CAPITAL MARKETS DAY

2 September 2015

Andaz London Liverpool Street

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Catalysis

Speaker

Pascal Reymondet

Executive Vice-President Catalysis

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Business Group profile

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Catalysis

Precious Metals Chemistry (PMC)

Pt Pd Ru Rh

Ag Ir Au Co Ga

Automotive Catalysts (AC)

Pt Pd Rh

Precious Metals Chemistry

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Main growth drivers

- Growth in Automotive Catalysts
- Increasing MOCVD business
- Growing hAPI business for life science applications

Profitability drivers

- Scale effects
- Operational excellence
- Proprietary production process technology


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Agenda

1 Business model

2 Business drivers

3 Market segments

4 Growth ambitions

5 Key takeaways

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Automotive Catalysts (AC)

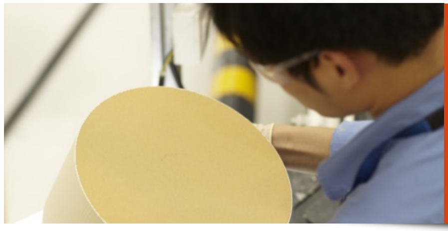
Business model:

At AC we develop technologies which allow our customers to meet automotive emission legislation at the lowest Total Cost of Ownership

Complete catalyst systems to reduce exhaust gas emissions

Customer focus

People engagement



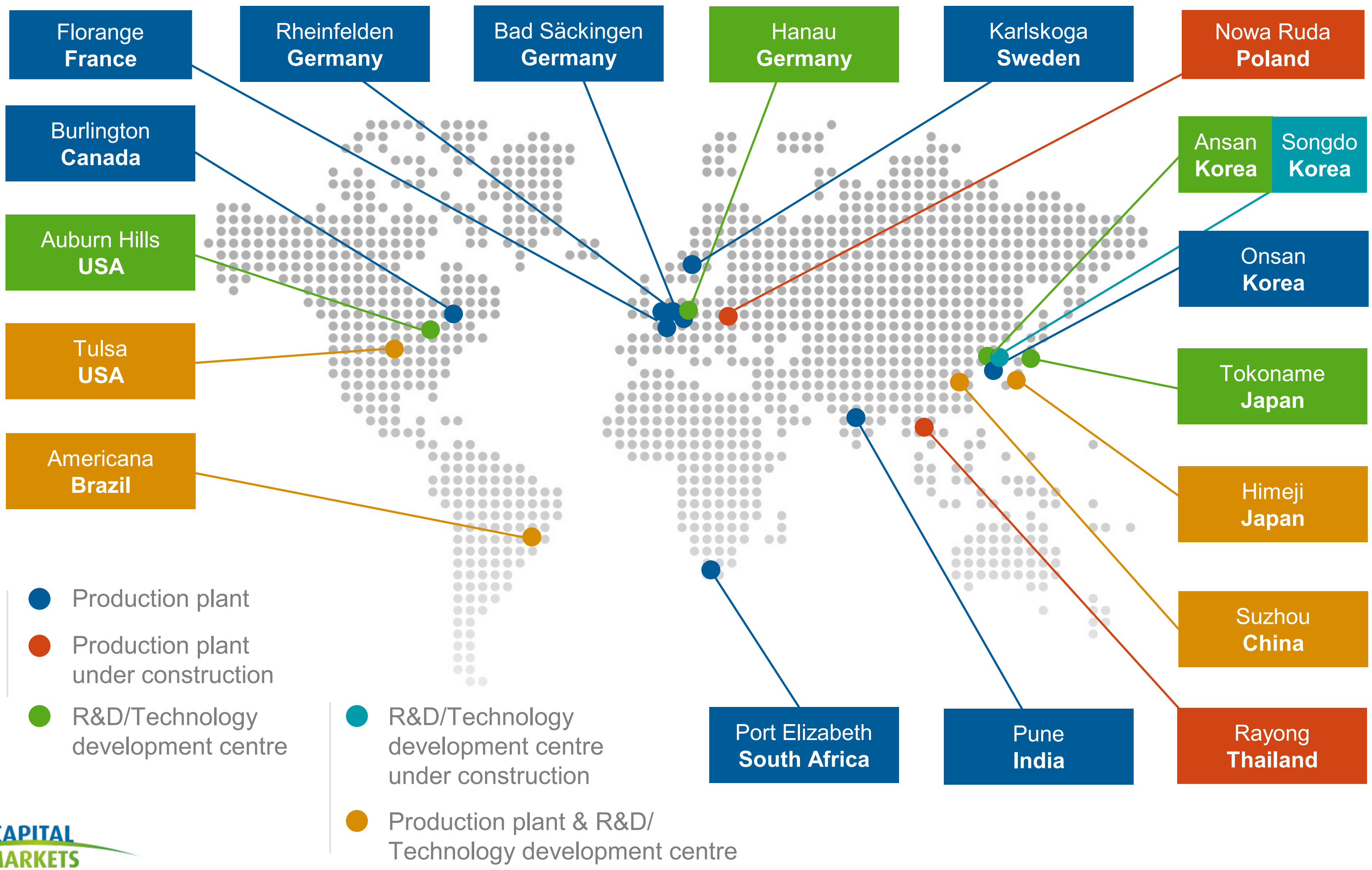
Operational excellence

Global manufacturing and technical footprint

One of three world leaders

Global footprint

16 plants in 13 countries, 8 R&D / test centres in 6 countries



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Global position in Light Duty Vehicles and Heavy Duty Diesel

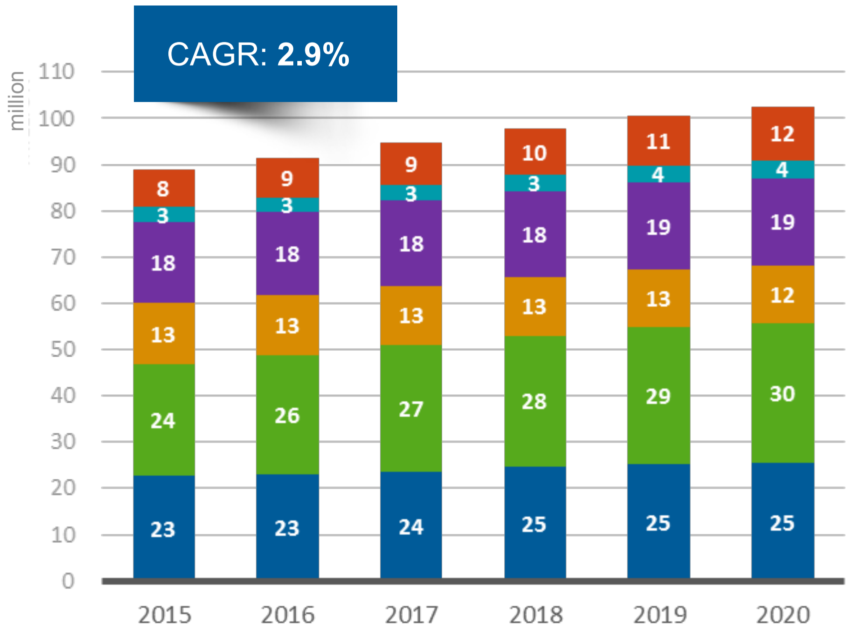
LDV	HDD
Broad technology portfolio addressing all emission control needs of gasoline and diesel engines	Broad technology portfolio for On-Road and Non-Road
Global R&D and test centre footprint	Global R&D and test centre footprint supporting running and future business
Established for more than 30 years	Comparative newcomer
Global production footprint	Production footprint in relevant regions
Solid track record with major global OEMs and newly awarded business with major Japanese OEMs	Contract wins with regional and global players
Strong presence in all regions and newcomer in South East Asia	Solid market position in Europe and well established market share in China

Agenda

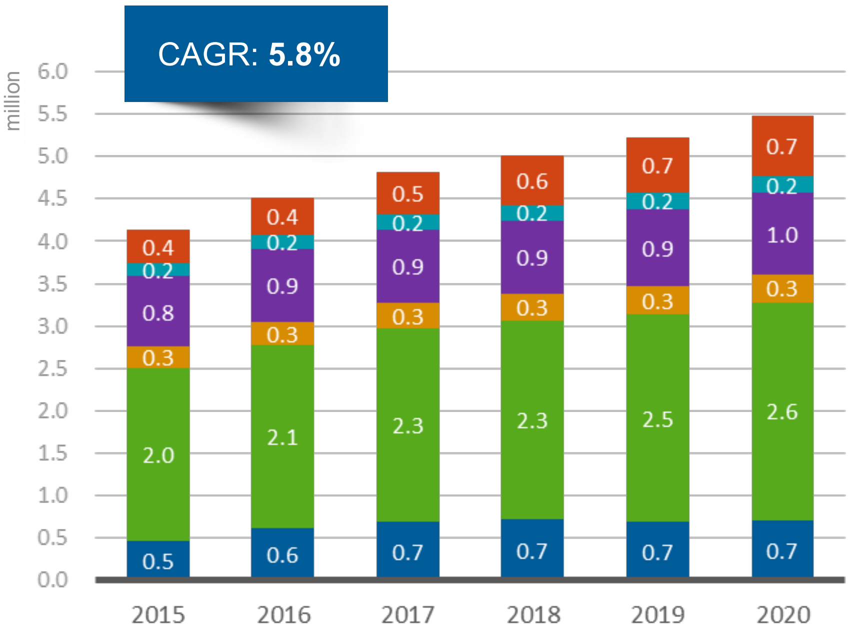
1	2	3	4	5
Business model	Business drivers	Market segments	Growth ambitions	Key takeaways

Light and heavy duty market segments set to grow

LDV Production by region



HDD Production by region



Europe/Africa · China · Japan/Korea · North America · South America · South Asia

Source: IHS, KGP and Umicore assumptions

Tightening legislation
A key driver for strong growth

LDV: 8 legislation changes **between 2015-2020**

- **Advanced markets**:
  CO_2 (fuel efficiency), Particulate Number and Real Driving Emission standards are main driver for new aftertreatment system solutions
- **Emerging markets:** Introduction of EU4/5 standards

HDD On-Road: 13 legislative changes with tighter standards **beyond 2015**

HDD Non-Road 4 legislative changes . . .

. . . providing opportunities for AC to position new technical solutions and win market share

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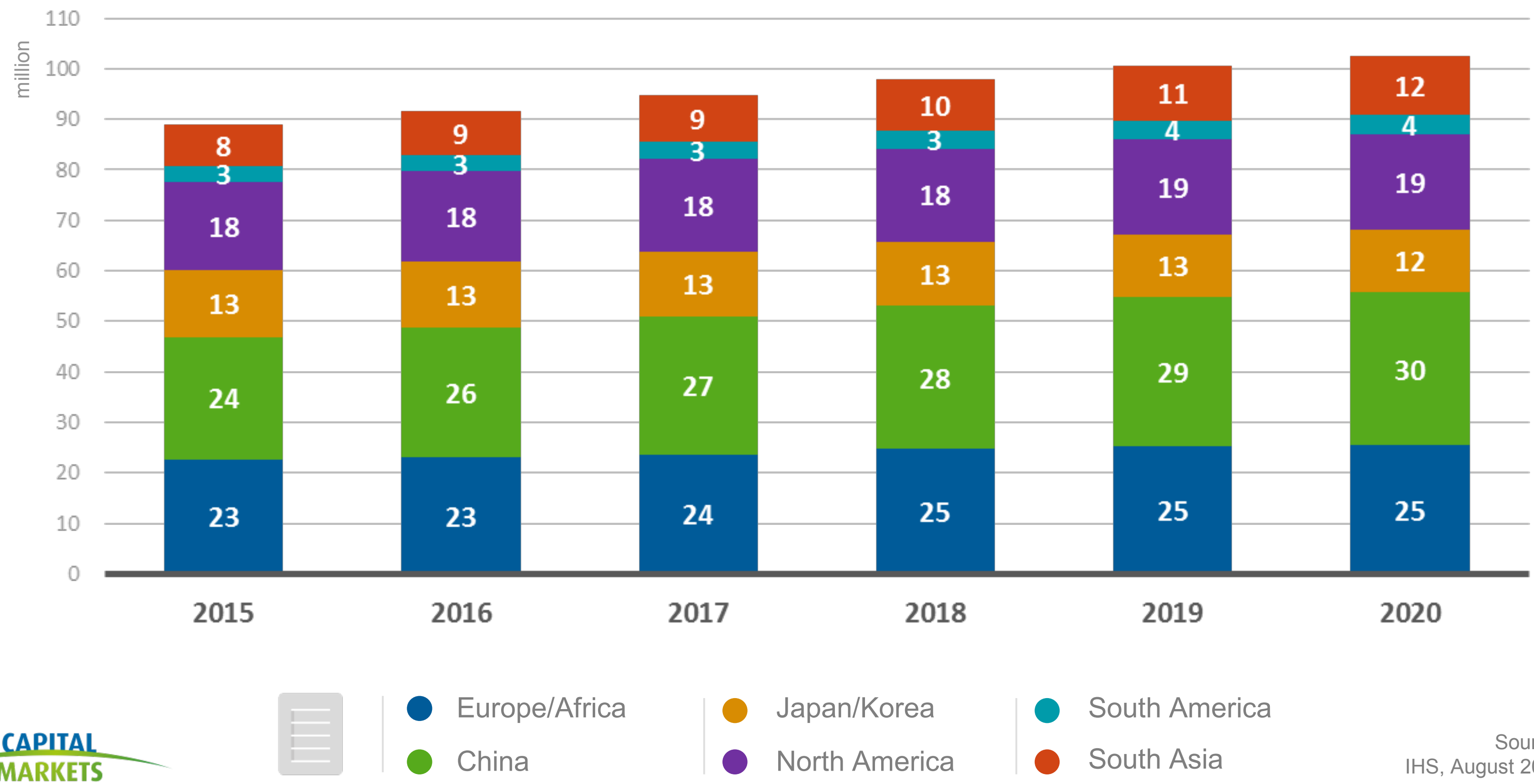
Light Duty Vehicle production

Growing market driven primarily by growth in Asia

LDV production by region

CAGR: **2.9%** globally | CAGR: **4.7%** China | CAGR: **7.5%** South Asia



Source:
IHS, August 2015

Gasoline dominates LDV Market

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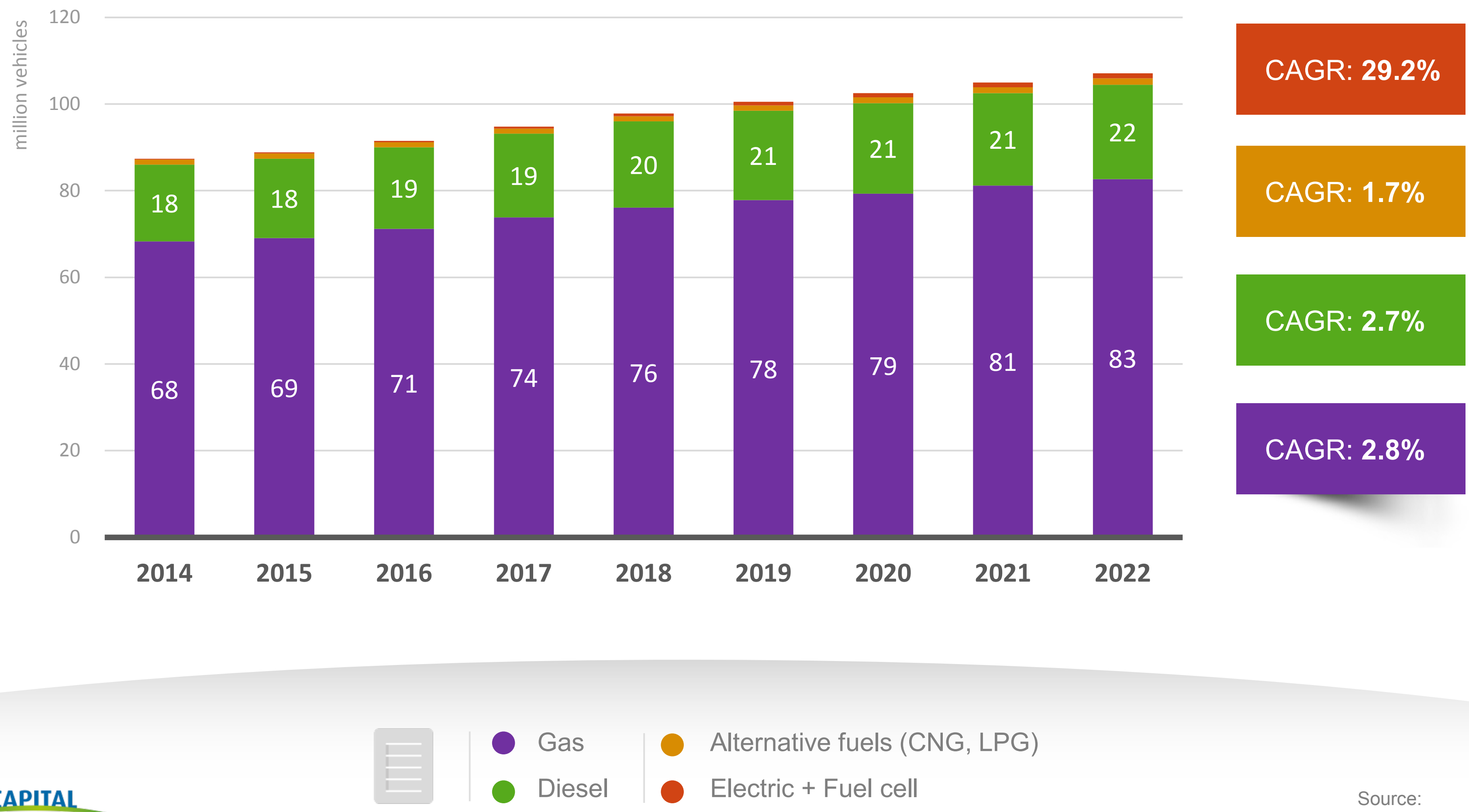
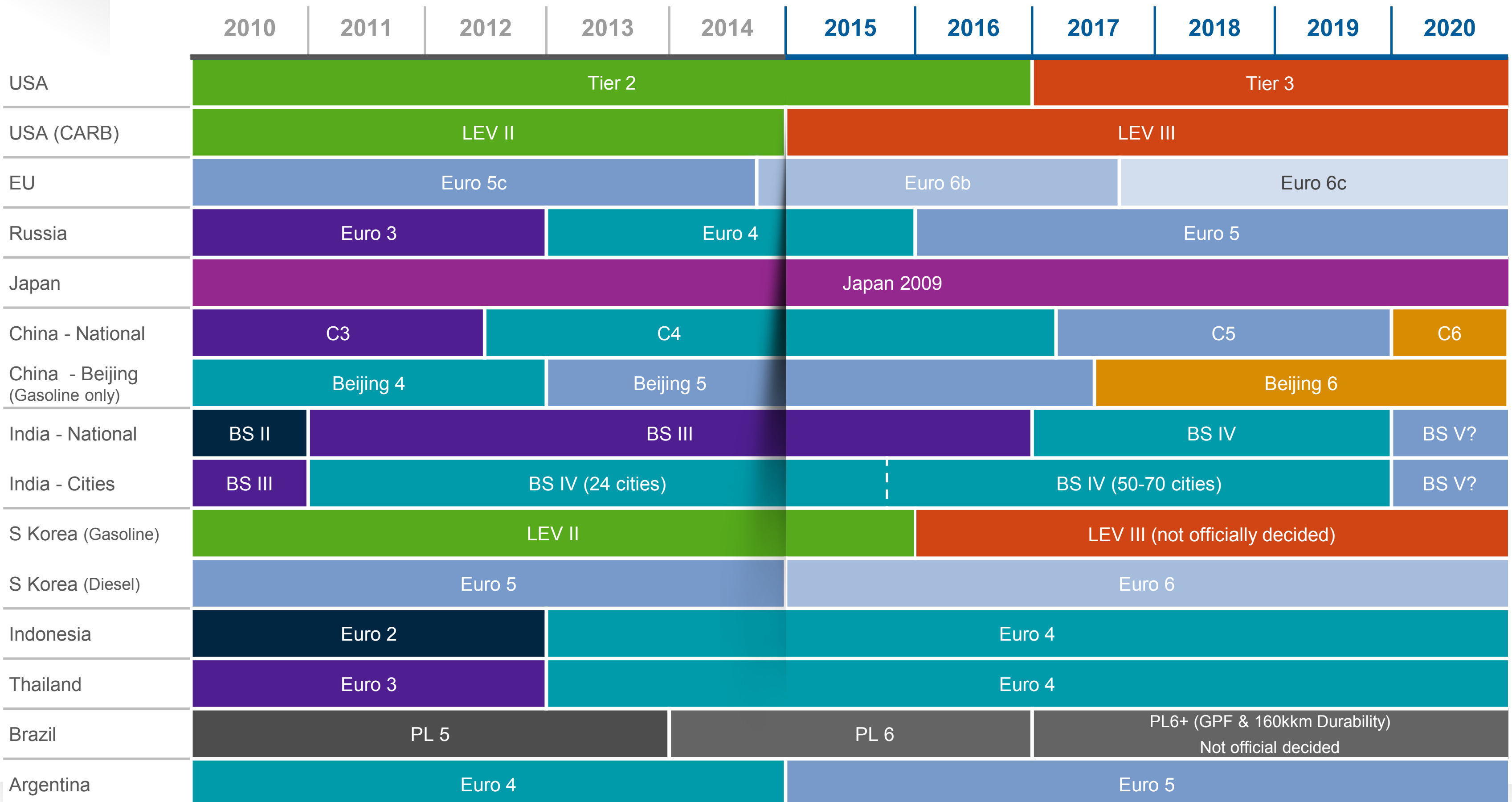
LDV engine production by fuel type



Source:
IHS, August 2015

LDV emission legislation roadmap



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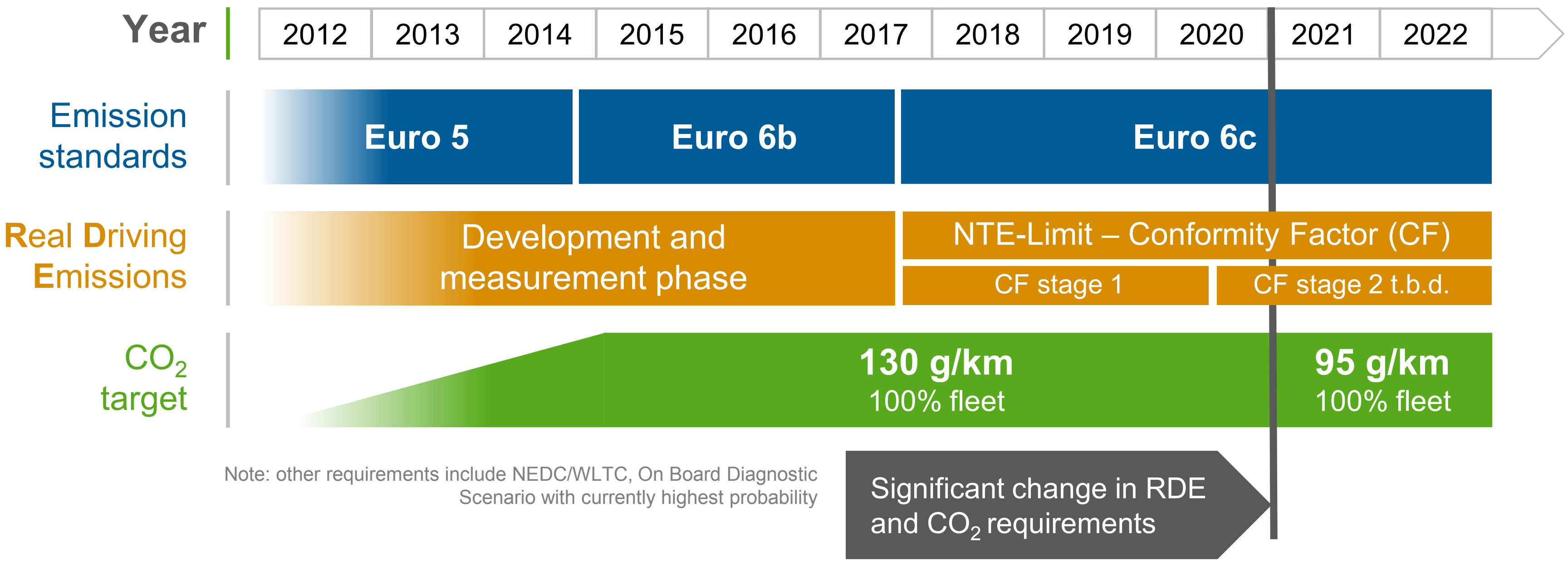
EU emission legislation roadmap

Legislation drives complexity



Note: other requirements include NEDC/WLTC, On Board Diagnostic
Scenario with currently highest probability

Diesel essential for compliance with CO_2 and fuel efficiency requirements

20 – 25% more fuel efficient and 15% less CO_2 than equivalent gasoline cars

Euro 6b diesel engines (clean diesel) remove 99.9% of number of particulates

Clean diesel cars (Euro 6c – stage 2) are as clean as equivalent gasoline cars

Diesel key in **reaching CO_2 targets**

Umicore uniquely positioned in the entire LDV drive train

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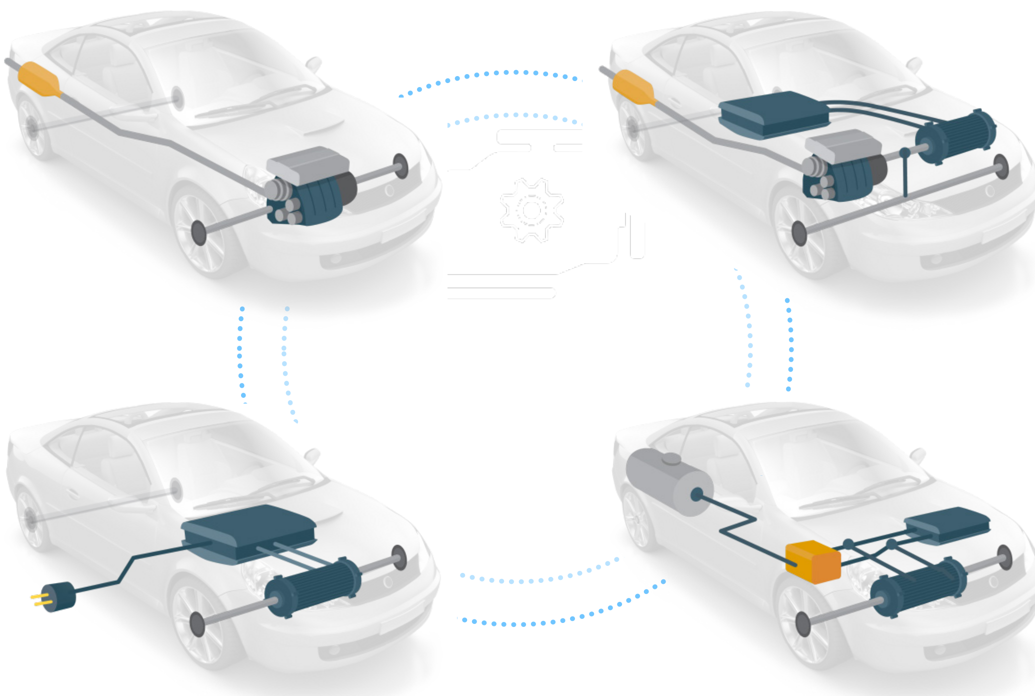
ICE
Emission control catalysts

(p)HEV
Battery cathode materials and emission control catalysts

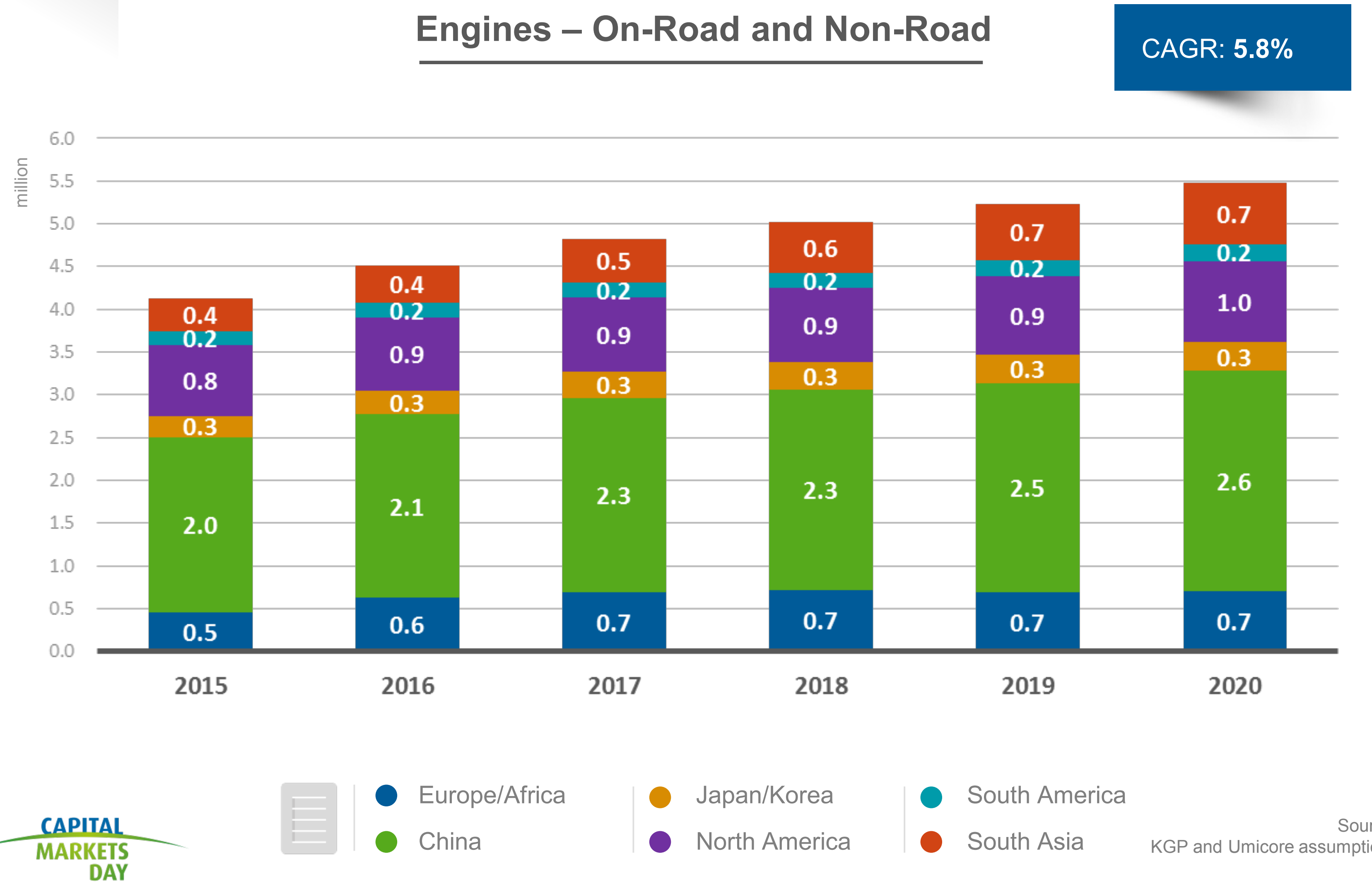


BEV
Battery cathode materials

Fuel cells
Electro-catalyst and battery cathode materials

Heavy Duty Diesel engine production

China dominates the HDD engine market . . .



Source:
KGP and Umicore assumptions

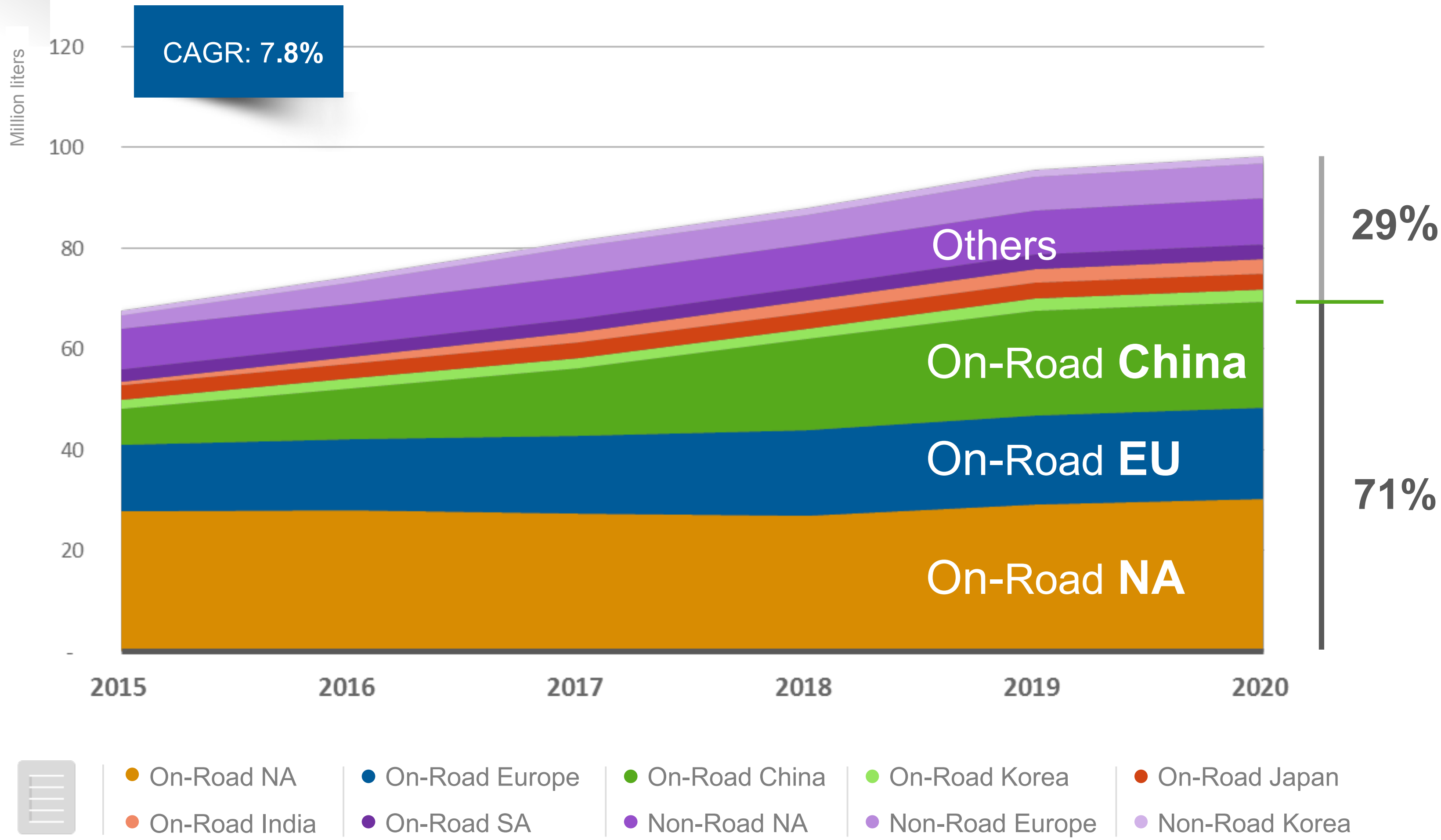
HDD emission legislation roadmap

HDD	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Europe	EU V					EU VI a,b		EU VI c			
North America	EPA10					GHG Regulation, Phase 1			GHG Regulation, Phase 2		
Japan	JP 09						JP 16				
South Korea	EU V					EU VI					EUVIc?
Brazil	EU III					EU V			EU VI ?		
Russia	EU III					EU IV			EU V		
India (Main Cities)						BS IV					BS V
India (Nationwide)	BS III							BS IV			BS V
China (Beijing)	Beijing IV					Beijing V		EU VI ?			
China (Nationwide)	CN III					CN IV		CN V			

NRMM	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Europe	Stage IIa	Stage IIIb				Stage IV					StageV
North America	Tier 3b	Tier 4a				Tier 4b					
Japan	Tier 3b	Tier 4a				Tier 4b					
South Korea	Tier 3b		Tier 4a			Tier 4b					
Brazil	Tier 3a						Tier 3b			Tier 4a ?	

Legislation drives complexity

NA remains largest market for catalysts



Source: KGP and Umicore assumptions

Legislation is key driver for growth in China (CAGR: 24.6%) and India (CAGR: 28.9%)

Current position in HDD segment

- Solid position in Europe with a full competitive product portfolio and production **lines running at full capacity**
- **Strong position** in Korea and in Brazil
- **Major CNIV and CNV awards won** in China and therefore well positioned to participate in the growth of the market
- Product Portfolio **technically competitive** for applications in North America

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Growth strategy 2015-2020

Light duty gasoline – increase our position largely through presence with Japanese OEMs

Light duty diesel – consolidate recent gains

HDD – grow faster than the HDD catalyst market

Umicore well positioned to outgrow the market

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Contracts secured in both LDV and HDD

Production capacity in place by 2016

Highly engaged people

Technical capabilities to address tightening norms

Portfolio of competitive technologies

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1	2	3	4	5
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Key takeaways

Market drivers – volumes (production) and value (legislation) are supportive

Umicore has the potential to **grow faster** than the catalyst market in both LDV and HDD

Umicore is unique in that we are **agnostic** on the technology choices not just in Internal Combustion Engine but also hybridization and electrification